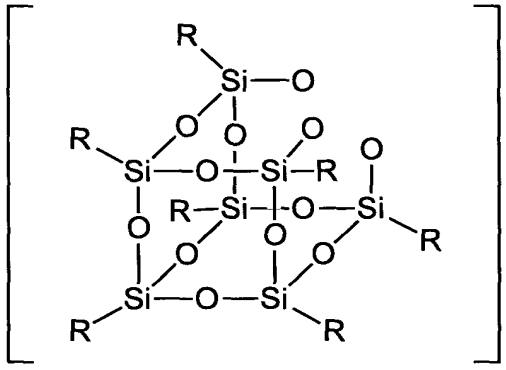
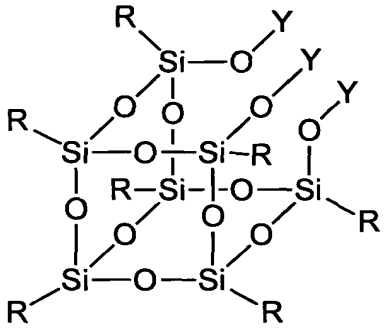
CLAIMS

1. A production process for a silsesquioxane derivative represented by Formula (2), characterized by using a silicon compound represented by Formula (1):



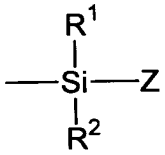
• 3M (1)



(2)

wherein in Formula (1), each R is a group selected independently from hydrogen, the group of alkyls in which the number of carbon atoms is 1 to 45, optional hydrogen may be replaced by fluorine, and optional $-CH_2-$ may be replaced by -O-, -CH=CH-, cycloalkylene or cycloalkenylene, the group of substituted or non-substituted aryls, and the group of substituted or non-

substituted arylalkyls in which in the alkylene group thereof, optional hydrogen may be replaced by fluorine, and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene; and M is a monovalent alkaline metal atom; in Formula (2), R has the same meaning as that of R in Formula (1); each Y is a group selected independently from groups represented by Formula (3) and hydrogen; and at least one of Y is a group selected from the groups represented by Formula (3):



(3)

wherein R^1 and R^2 represent independently the group defined in the same manner as R in Formula (1); Z is a functional group or a group having a functional group; provided that Z is not any of a group having a dithiocarbamate group, a group having haloalkylphenyl and a group having an α-haloester group.

2. The production process according to Claim 1, wherein each R in Formula (1) is a group selected independently from hydrogen, the group of alkyls in which the number of carbon atoms is 1 to 20, optional hydrogen may be replaced by fluorine and optional $-CH_2-$ may be replaced by -O- or cycloalkylene, the group of alkenyls in which the number of carbon atoms is 2 to 20, optional

hydrogen may be replaced by fluorine and optional $-CH_2-$ may be replaced by -O- or cycloalkylene, the group of alkyls in which the number of carbon atoms is 1 to 10 and at least one $-CH_2-$ is replaced by cycloalkenylene, the group of phenyls in which optional hydrogen on the benzene ring may be replaced by halogen or alkyl having 1 to 10 carbon atoms, the group of phenylalkyls in which optional hydrogen on the benzene ring may be replaced by halogen or alkyl having 1 to 10 carbon atoms, and naphthyl; in the alkyl having 1 to 10 carbon atoms which is a substituent on the benzene ring, optional hydrogen may be replaced by fluorine, and optional $-CH_2-$ may be replaced by -O-, -CH=CH-, cycloalkylene or phenylene; and in alkylene of the phenylalkyl, the number of carbon atoms is 1 to 12 , optional hydrogen may be replaced by fluorine, and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene.

3. The production process according to Claim 1, wherein each R in Formula (1) is a group selected independently from the group of alkyls in which the number of carbon atoms is 1 to 10, optional hydrogen may be replaced by fluorine and optional $-CH_2-$ may be replaced by -O- or cycloalkylene, the group of phenyls in which optional hydrogen on the benzene ring may be replaced by halogen, methyl or methoxy, the group of phenylalkyls in which optional hydrogen on the benzene

ring may be replaced by fluorine, alkyl having 1 to 4 carbon atoms, vinyl or methoxy, and naphthyl; and in alkylene of the phenylalkyl, the number of carbon atoms is 1 to 8, and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene.

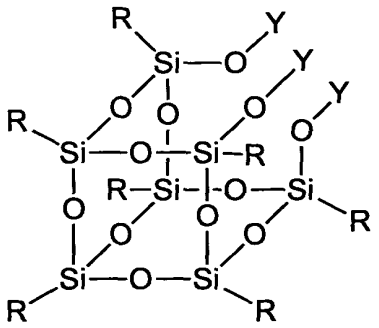
4. The production process according to Claim 1, wherein all of R in Formula (1) are the same group selected from the group of alkyls in which the number of carbon atoms is 1 to 10, optional hydrogen may be replaced by fluorine and optional $-CH_2-$ may be replaced by -O- or cycloalkylene, the group of phenyls in which optional hydrogen on the benzene ring may be replaced by halogen, methyl or methoxy, the group of phenylalkyls in which optional hydrogen on the benzene ring may be replaced by fluorine, alkyl having 1 to 4 carbon atoms, vinyl or methoxy, and naphthyl; and in alkylene of the phenylalkyl, the number of carbon atoms is 1 to 8, and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene.

5. The production process according to any one of Claims 1 to 4, wherein M in Formula (1) as described in Claim 1 is Na.

6. The production process according to any one of Claims 1 to 4, wherein M in Formula (1) as described in

Claim 1 is Na; in Formula (3) as described in Claim 1, R^1 and R^2 represent independently methyl, isopropyl, tert-butyl or phenyl; and Z is a functional group selected from the group consisting of hydrogen (bonded to Si atom), fluorine, chlorine, bromine, -OH, fluorinated alkyl, alkoxy, -COOH, -COO-, -OCO-, 2-oxapropanedioyl, polyalkyleneoxy, epoxy group, an oxetane ring, -NH-, $-NH_2$, -CN, -NCO, alkenyl, cycloalkenyl, -SH and $-PH_2$, or a group having the functional group, provided that Z is not any of a group having a dithiocarbamate group, a group having haloalkylphenyl and a group having an α-haloester group.

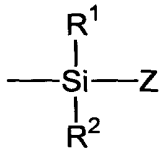
7. A silsesquioxane derivative represented by Formula (2):



(2)

wherein each R is a group selected independently from the group of alkyls in which the number of carbon atoms is 1 to 20, at least one hydrogen is replaced by fluorine and optional $-CH_2-$ may be replaced by -O-, the group of phenyls in which optional hydrogen on the benzene ring

may be replaced by halogen or alkyl having 1 to 10 carbon atoms, the group of phenylalkyls in which optional hydrogen on the benzene ring may be replaced by halogen or alkyl having 1 to 10 carbon atoms and in the alkylene group thereof, optional hydrogen may be replaced by fluorine and optional $-CH_2-$ may be replaced by $-O-$, $-CH=CH-$ or cycloalkylene, and naphthyl; in the alkyl having 1 to 10 carbon atoms which is a substituent on the benzene ring, optional hydrogen may be replaced by fluorine, and optional $-CH_2-$ may be replaced by $-O-$, $-CH=CH-$, cycloalkylene or phenylene; each Y is a group selected independently from groups represented by Formula (3) and hydrogen; and at least one of Y is a group selected from the groups represented by Formula (3):



(3)

wherein R^1 and R^2 represent independently the group defined in the same manner as R in Formula (2); Z is a functional group selected from the group consisting of hydrogen (bonded to Si atom), fluorine, chlorine, bromine, -OH, fluorinated alkyl, alkoxy, -COOH, -COO-, -OCO-, 2-oxapropanedioyl, polyalkyleneoxy, epoxy group, an oxetane ring, -NH-, $-NH_2$, -CN, -NCO, alkenyl, cycloalkenyl, -SH and $-PH_2$, or a group having the functional group; provided that Z is not any of a group having a

dithiocarbamate group, a group having haloalkylphenyl and a group having an α-haloester group.

8. The silsesquioxane derivative according to Claim 7, wherein each R in Formula (2) is a group selected independently from the group of alkyls in which the number of carbon atoms is 1 to 10, at least one hydrogen is replaced by fluorine and one $-CH_2-$ may be replaced by -O-, the group of phenyls in which optional hydrogen on the benzene ring may be replaced by halogen, methyl or methoxy, the group of phenylalkyls in which optional hydrogen on the benzene ring may be replaced by fluorine, alkyl having 1 to 4 carbon atoms, vinyl or methoxy and in the alkylene group thereof, the number of carbon atoms is 1 to 8 and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene, and naphthyl.

9. The silsesquioxane derivative according to Claim 7, wherein all of R are the same group selected from the group of alkyls in which the number of carbon atoms is 1 to 10, at least one hydrogen is replaced by fluorine and one $-CH_2-$ may be replaced by -O-, the group of phenyls in which optional hydrogen on the benzene ring may be replaced by halogen, methyl or methoxy, the group of phenylalkyls in which optional hydrogen on the benzene ring may be replaced by fluorine, alkyl having 1 to 4 carbon atoms, vinyl or methoxy and in the alkylene group

thereof, the number of carbon atoms is 1 to 8 and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene, and naphthyl.

10. The silsesquioxane derivative according to Claim 7, wherein all of R in Formula (2) are phenyl, and R^1 and R^2 in Formula (3) represent independently methyl, isopropyl, tert-butyl or phenyl.

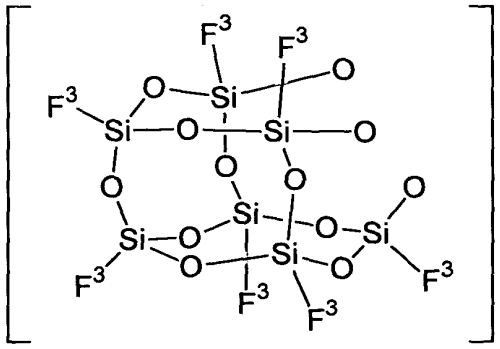
11. The silsesquioxane derivative according to Claim 7, wherein all of R in Formula (2) are alkyl in which the number of carbon atoms is 1 to 10, at least one hydrogen is replaced by fluorine and one $-CH_2-$ may be replaced by -O-, and R^1 and R^2 in Formula (3) represent independently methyl, isopropyl, tert-butyl or phenyl.

12. The silsesquioxane derivative according to Claim 7, wherein all of R in Formula (2) are 3,3,3-trifluoropropyl, and R^1 and R^2 in Formula (3) represent independently methyl, isopropyl, tert-butyl or phenyl.

13. The silsesquioxane derivative according to Claim 7, wherein all of R in Formula (2) are tridecafluoro-1,1,2,2-tetrahydrooctyl, and R^1 and R^2 in Formula (3) represent independently methyl, isopropyl, tert-butyl or phenyl.

14. The silsesquioxane derivative according to any one of Claims 7 to 13, wherein Z in Formula (3) as described in Claim 7 is hydrogen, chlorine, -OH, alkenyl, fluorinated alkyl, or a group having any of fluorine, chlorine, bromine, -OH, alkenyl, fluorinated alkyl, -COOH, 2-oxapropanedioyl, polyalkyleneoxy, acryloyloxy, methacryloyloxy, oxiranyl, 3,4-epoxycyclohexyl, oxetanyl, oxetanylene, $-NH_2$, -CN and -SH;
provided that Z is not any of a group having a dithiocarbamate group, a group having haloalkylphenyl and a group having an α-haloester group.

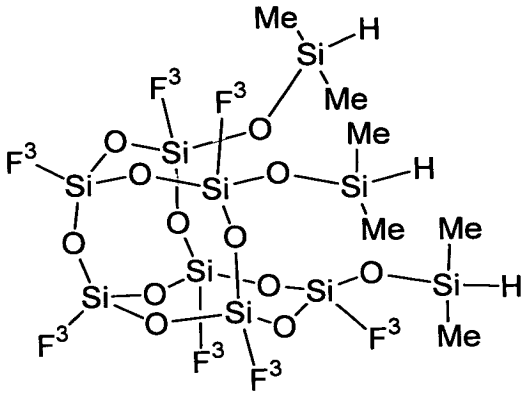
15. A compound represented by Formula (1-2):



•3Na (1-2)

wherein F^3 is $-CH_2CH_2CF_3$.

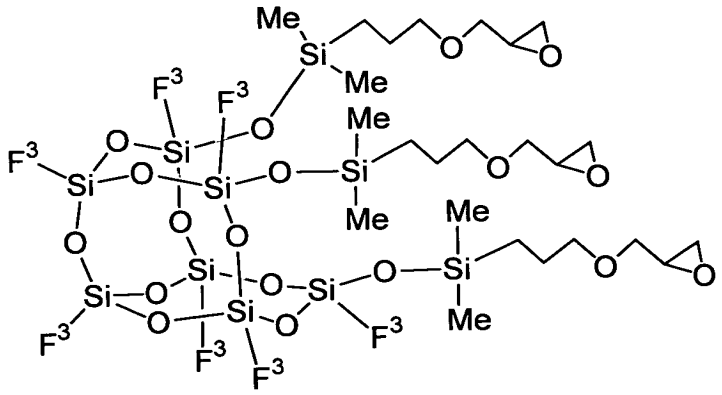
16. A compound represented by Formula (18):



(18)

wherein F^3 is $-CH_2CH_2CF_3$, and Me is methyl.

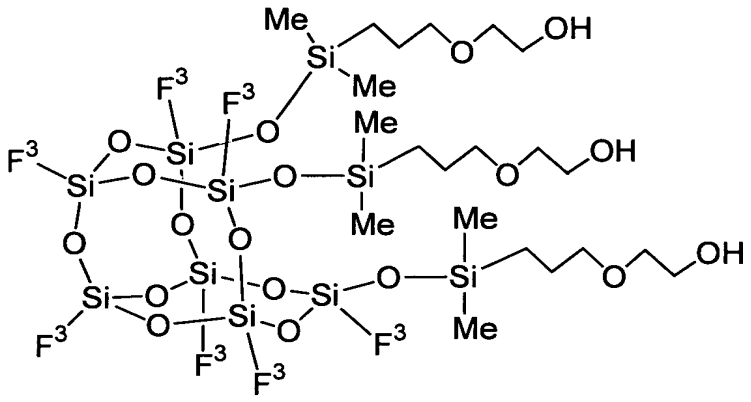
17. A compound represented by Formula (19):



(19)

wherein F^3 is $-CH_2CH_2CF_3$, and Me is methyl.

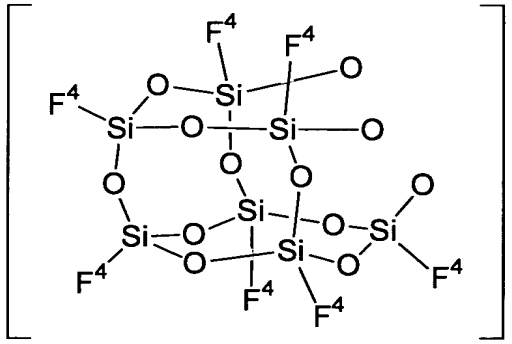
18. A compound represented by Formula (20):



(20)

wherein F^3 is $-CH_2CH_2CF_3$, and Me is methyl.

19. A compound represented by Formula (1-5):



(1-5)

wherein F^4 is $-CH_2CH_2(CF_2)_5CF_3$.